USSR

UDC 621.762.004.2

POPOV. Ye. I.

"Ignition of Aluminum-Magnesium Alloy Powders in Moist Air"

Problemy inzhenernoy okhrany truda [Problems of Engineering Protection of Labor], (Moscow Institute of Steels and Alloys, 63), Moscow, 1970, pp. 19-21, (Translated from Referativnyy Zhurnal-Metallurgiya, No. 1, 1971, Abstract No.1 G505 by the author).

Translation: Results of experiments have shown that 2% moisture in the air reduces the ignition point, while humidities of over 15% increase the ignition point. The mechanism of ignition in a moist medium is determined, and it is established that the influence of moisture is catalytic in nature. 2 tables.

1/1

1/2 006 UNCLASSIFIED PROCESSING DATE--30OCT70
TITLE--THEORETICAL STUDY OF CONFORMATIONS OF N,ACETYL,L,PHENYLALANINE METHYLAMIDE -U-
AUTHOR-(03)-LIPKIND, G.M., ARKHIPOVA, S.F., POPOV, YE.M.

COUNTRY OF INFO--USSR

SOURCE--IZV. AKAD. NAUK SSSR, SER. KHIM. 1970, (2), 315-22

DATE PUBLISHED--------70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--PHENYLALANINE, AMIDE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--2000/0750 STEP NO--UR/0062/70/000/002/0315/0322

CIRC ACCESSION NO--AP0124420
UNCLASSIFIED

2/2 006 UNCLASSIFIED PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0124420

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. CONFORMATIONAL ANAL. WAS MADE FOR N.ACETYL,L,PHENYLALANINE METHYLAMIDE AND THE MOL. MAP PROJECTIONS WERE PRESENTED AND DISCUSSED. FACILITY: INST. KHIM. PRIR. SOEDIN., MOSCOW, USSR.

UNCLASSIFIED

1/2 017 UNCLASSIFIED PROCESSING DATE--04DEC70

TITLE--CORRELATIONS AMONG LENGTHS, ORDERS, HYBRIDIZATION OF ATOMS, AND FORCE CONSTANTS OF CARBON NITROGEN AND CARBON OXYGEN BONDS -U-

AUTHOR-(03)-POPOV, YE.M., KOGAN, G.A., ZHELTOVA, V.N.

COUNTRY OF INFO--USSR

SOURCE--TEOR. EKSP. KHIM. 1970, 6(1), 14-22

DATE PUBLISHED-------70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--NITROGEN COMPOUND, CARBON COMPOUND, CHEMICAL BONDING, OXYGEN

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--3008/0346 STEP NO--UR/0379/70/006/001/0014/0022

CIRC ACCESSION NO--AP0137450
UNCLASSIFIED

UNCLASSIFIED PROCESSING DATE--04DEC70

2/2 017
CIRC ACCESSION NO--AP0137450
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE CHARACTER OF THE C-N AND C-O BONDS ARE INVESTIGATED IN THE FOLLOWING DEPENDENCIES: THE ORDERS OF THE BONDS VS. LENGTH, LENGTH OF THE BOND VS. AV. PERCENTAGE OF S CHARACTER, AND THE BOND ORDER VS. PI CONTRACTION OF THE BONDS. THE DIFFERENCES OF THE LENGTHS OF THE BONDS ARE DUE MOSTLY TO THE SPECIFICITY OF THE SIGMA BONDS. THE PLOT OF THE LENGTHS OF THE SIGMA BONDS OF C-N AND C-O VS. THE AV. PERCENTAGE OF S CHARACTER IS LINEAR. THE GREATEST CHANGE IN THE LENGTH WITH THE PI BOND ORDER OF C-N AND C-O STARTS AT A PI BOND ORDER OF 0.3. THE DEPENDENCE IS LINEAR. AT A PI BOND ORDER OF 1.0, THE SLOPE OF THE DEPENDENCE AGAIN BECOMES SMALLER. THE DEPENDENCE OF THE PI BOND ORDER ON THE FORCE CONST. IS DISCUSSED.
FACILITY: INST. KHIM. PRIR. SOEDIN., MOSCOW, USSR.

UNCLASSIFIED

1/2 019 UNCLASSIFIED PROCESSING DATE--13NOV70

TITLE--THEORETICAL STUDY OF N,ACETYL,L,ALANINE METHYLAMIDE CONFORMATIONS IN VARIOUS MEDIA -U-

AUTHOR-(03)-LIPKIND, G.M., ARKHIPOVA, S.F., POPOV, YE.N.

COUNTRY OF INFO--USSR

SOURCE--ZH. STRUKT. KHIM. 1970, 11(1), 121-6 (RUSS)

DATE PUBLISHED--------70

SUBJECT AREAS--CHEMISTRY, BIOLOGICAL AND MEDICAL SCIENCES

TOPIC TAGS--ALANINE, AMIDE, HYDROGEN BONDING, ENTROPY, DIPOLE MOMENT, SOLVENT ACTION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED
PROXY REEL/FRAME--2000/1643 STEP NO--UR/0192/70/011/001/0121/0126

CIRC ACCESSION NO--AP0125265

UNCLASSIFIED

2/2 019 UNCLASSIFIED PROCESSING DATE--13NOV70
CIRC ACCESSION NO--AP0125265
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. ENERGY MAPS WERE CONSTRUCTED MATH., CORRESPONDING TO THE VARIOUS EXTENDED AND COILED CONFORMATIONS POSSIBLE IN N,ACETYL,L,ALANINE METHYLAMIDE FOR SOLVENT SYSTEMS OF DIFFERENT DIELEC. CONSTS., BASED ON ESTD. STRENGTHS OF THE H BONDS IN SUCH MEDIA. THE DIPOLE MOMENTS WERE CALCD. FOR THE VARIOUS CONFORMATIONS AND THE ENTROPY IMPLICATIONS OF THE ENERGY MAPS ARE DISCUSSED. FACILITY: INST. KHIM. PRIR. SOEDIN., MOSCOW, USSR.

UNCLASSIFIED

1/2 008 UNCLASSIFIED PROCESSING DATE--23OCT70

TITLE--THEORETICAL ANALYSIS OF CONFORMATIONS OF SOME METHYLAMIDES OF N ACETYLDIPEPTIDES -U-

AUTHOR-(03)-LIPKIND, G.M., ARKHIPOVA, S.F., POPOV, YE.M.

COUNTRY OF INFO--USSR

SOURCE--MOLEKULYARNAYA BIOLOGIYA, 1970, VOL 4, NR 3, PP 331-338

DATE PUBLISHED--------70

SUBJECT AREAS--BIOLOGICAL AND MEDICAL SCIENCES, CHEMISTRY

TOPIC TAGS--PEPTIDE, MOLECULAR STRUCTURE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1998/0177 STEP NO--UR/0463/70/004/003/0331/0338

CIRC ACCESSION NO--AP0120877

UNCLASSIFIED

2/2 008 UNCLASSIFIED PROCESSING DATE--23OCT70
CIRC ACCESSION NO--AP0120877
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE CONFORMATIONS OF THE MOLECULS WITH THREE AMIDE GROUPS: N,ACETYLGLYCYLGLYCINE, N,ACETYL,L (D) ALANYL,L,ALANINE AND N,ACETYL,L,VALYL,L,VALINE HAVE BEEN INVESTIGATED. THE GEOMETRICAL PARAMETERS OF FAVORABLE FORMS WITHOUT HYDROGEN BONDING HAVE BEEN CALCULATED USING THE MINIMIZATION PROCEDURE AND DEPICTED ON THE TWO DIMENSIONAL PHI (C PRIMEALPHA MINUS N) MINUS PSI (C PRIMEALPHA MINUS C PRIME) CONFORMATIONAL MAPS. THE VALUES OF THE PHI AND PSI ANGLES IN THE PREFERRED CONFORMATIONS OF CORRESPONDING COMPOUNDS WITH TWO AMINO GROUPS CAN BE USED AS THE ZERO APPROXIMATION IN THE SEARCH FOR THE POTENTIAL ENERGY MINIMUM OF THE OLIGOPEPTIDES. THE SIGNIFICANT SCATTERING IN THE PHI AND PSI VALUES FOUND FOR THE METHYLAMIDES OF N ACETYLDIPEPTIDES AS WELL AS THE DEVIATIONS FROM ADDITIVITY OF ENERGIES ARISING WITH INCREASE OF PEPTIDE CHAIN LENGTH CAN BE CONSIDERED AS THE EVIDENCE FOR MUTUAL DEPENDENCE OF CONFORMATIONAL STATE OF THE TWO AMINO ACID RESIDUES. THE MOST STABLE AMONG THE STRETCHED FORMS INVESTIGATED ARE THOSE THAT HAVE THE ANGLES OF ROTATION ABOUT THE C PRIMEALPHA MINUS N AND C PRIMEALPHA C PRIME BONDS CLOSE TO THOSE OCCURING IN THE RIGHT HANDED ALPHA HELIX AND IN THE BETA STRUCTURE. THE EFFECT OF DISTURBANCES OF THE STEREOREGULARITY OF THE ASYMMETRIC CENTERS IN THE PEPTIDE CHAIN ARE ALSO DISCUSSED. FACILITY: INSTITUTE FOR CHEMISTRY OF NATURAL PRODUCTS, ACADEMY OF SCIENCES, USSR, MOSCOW.

UNCLASSIFIED

APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002202520003-5"

USSR

UDC 62-50

BESEKERSKIY, V. A., and POPOV, Ye. P.

"Theory of Automatic Control Systems"

Teoriya Sistem Avtomaticheskogo Regulirovaniya, Moscow, Nauka Press, 1972, 768 pp

Translationof Annotation: This book is a monograph devoted to a systematic presentation of the theory of automatic regulation and control. The book contains all of the most important sections of the theory of automatic control: the theory of ordinary and special linear systems and the theory of nonlinear, adaptive, and digital systems. The book is designed for teachers and students specializing in the area of automatic regulation and control but can also be used by engineers and scientific workers for independent study of theoretical problems. 39 tables, 524 figures, 153 bibliographic references.

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BESEKERSKIY, V. A., and POPOV, Ye. P., Teoriya Sistem Avtomaticheskogo Regulirovaniya, Moscow, Nauka Press, 1972, 768 pp

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BESEKERSKIY, V. A., and POPOV, Ye. P., Teoriya Sistem Avtomaticheskogo Regulirovaniya, Moscow, Nauka Press, 1972, 768 pp

USSR

BESEKERSKIY, V. A., and POPOV, Ye. P., Teoriya Sistem Avtomaticheskogo Regulirovaniya, Moscow, Nauka Press, 1972, 768 pp

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USSR

UDC 62-50:629.198.3

POPOV, YE. P., USSR

"Nonlinear Problems of Spacecraft Angular Orientation"

Moscow, Upravleniye v Prostranstve, Vol 1, 1973, pp 112-119

Abstract: (This is the first of two volumes reporting on the Fourth International Symposium of IFAC on Automatic Control in Space, held in Dubrovnik, Yugoslavia, Sep 71).

Nonlinearities may exist at all stages of the control process: sensing, programming, or implementation. They may be deliberate or forced by the nature of the equipment used.

In designing apparatus of this type, a strict mathematical solution can be obtained only by considerable simplification of the equations, which can lead to qualitatively incorrect representation of the mechanism. Another approach involves seeking mathematical solutions by approximattion methods; although the solutions are approximate, the representation of the process is correct in principle. This sort of mathematical analysis should be undertaken before machine simulation of the system begins. The method of harmonic linearization can be used not only for steady state oscillations but also for the passage of transitory control signals in the presence of auto-oscillations, external vibrational interference, etc.

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USSR

POPOV, YE. P., Moscow, Upravleniye v Prostranstve, Vol 1, 1973, pp 112-119

The application of this method in the presence of auto-oscillation is illustrated for a system using a combined pulse-relay control principle to achieve close to the minimal expenditure of working fluid. The system uses the angular deviation signal and information about the sign of the rate of deviation.

Vibrational interference can arise in several ways, particularly in long, thin-walled interplanetary spacecraft. The net effect of these vibrations is to reduce the amount of information transmitted to the control apparatus. If the vibrations are sufficiently strong, the entire control process can be destabilized. The effects of this type of interference can also be analyzed by harmonic linearization.

All three sections of this report considered only the first harmonic oscillation at the output of the nonlinear unit, since the linear portion of the system usually does not pass higher harmonics in real control systems. If necessary, however, it is possible to consider a series of higher harmonics (the approximation method for this is not discussed in this article).

2/2

Spacecraft control

JPRS 52277
24 Jan 71

UDC: 629.19

SCIENTIFIC PROBLEMS IN THE CONTROL OF AEROSPACE VEHICLES

[Article by Academician B. N. Petrov and corresponding members of the AS USSR A. A. Krasovskiy, Ye. P. Popov, and B. V. Raushenbakh; Moscow, Vestnik Akademii Nauk SSSR, Russian, Vol 40, No 11, November 1970, pp 47-52]

The circle of problems of the science of control of aerospace vehicles is very extensive and embraces the following main directions:

theoretical investigations of the dynamics of processes of automatic control;

theoretical investigations of the joint functioning of man and automata in the control process;

the use of new physical and bionic principles to construct instruments and other technical means of systems for the navigation and control of aerospace vehicles.

the complex development of systems for the control of aerospace vehicles or group of aerospace vehicles as systems combining in a single whole a large number of different subsystems, instruments, automata, and on-board and ground means, with the reception, processing and transmission of a considerable quantity of information between and outside the units of the system;

the construction of very effective systems for the testing, inspection and operation of the entire complex of apparatus for the control of aerospace vehicles, and also systems of general flight guidance during tests and operations.

On the whole, problems of the control of aerospace vehicles at the present time represent an applied region in which all the achievements of the theory of automatic control find very rapid realization. However, if one takes into consideration the high order of the dynamic equations in the problems of

POPOV, Ye. P.

UDC: 681.142.621

USSR

ALEKSEYEV, V. A., BELOLESTNYKH, V. A., V'YUKHIN, V. N., KASPEROVICH, A. N., POPOV, Yu. A., SOLOHENKO, V. I., Novosibirsk

"A Multipoint High-Speed Digital System for Data Collection and Storage"

Novosibirsk, Avtometriya, No 4, Jul/Aug 71, pp 40-50

Abstract: The article describes a multipoint high-speed digital system for data collection and storage developed at the Atomic Energy Institute of the Siberian Department of the Academy of Sciences of the USSR for converting a large volume of analog information to digital form prior to computer input. The system contains a level-fixing module, a commutator with its own control unit, a data-stacking unit, a core store, a system control unit, and a CRT display. Block and circuit diagrams are presented, and the purpose and operation of each element of the system is described. Initial tests of the pilot model of the system have shown that it satisfies the design requirements. Printed-circuit construction is used, and the system is accommodated in two equipment bays -- one for the system proper, and the other for the core store. Seven figures, two tables, bibliography of [illegible] titles.

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UDC 669.187

USSR

POPOV, YU. A., BOCHKOV, YU. M., and TARAKANOV, L. A.

"Evaporation of Manganese, Nickel, and Iron by Cathode Ray Remelting of Iron-Nickel Alloy"

Proizvodstvo Chernykh Metallov [Production of Ferrous Metals--Collection of Works], No 75, Metallurgiya Press, 1970, pp 155-158

Translation: The rates of evaporation of iron and nickel during cathode ray remelting of iron-nickel alloy are calculated. Experimental and calculated data are compared. The relationship of concentrations of iron and nickel in the surface layer during cathode ray remelting is determined. Data are presented on the evaporation of manganese, and on its distribution through the cross section of the ingot as a function of melting rate. 2 figures; 2 tables; 2 biblio. refs.

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UR 0482

Soviet Inventions Illustrated, Section I Chemical, Derwent, 70

240654 TUBE DRAWING ASSEMBLY provides firm tube distribution on the drum. It consists of a guide draw plate 1, working draw plate 2 and an additional plate 3. The plates are divided by sleeves 4 and enclosed in a body 5 with a cover 6. The plate 2 has a diameter equal to the diameter of the tube whilst the plates 2 and 3 are of equal smaller diameter.

AUTHORS: Ural'skiy, V. I.; Patseruk, A. P.; Popov, Yu. A.; and Pedas, V. P.

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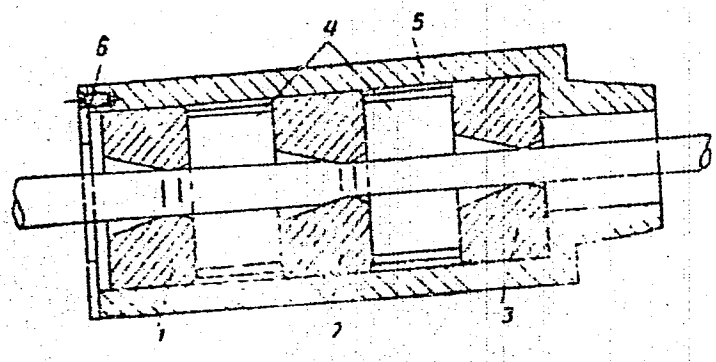

19.5.67 as 1156931/22-2. V.I. URALSKY et alia.
(21.8.69.) Bul 13/1.4.69. Class 7b. Int.Cl.B 21c.

19750241

USSR

UDC: 681.325.65

BABALOVA, I. F., POPOV, Yu. A., SHIRANOVA, S. F.

"Problems of Calculating the Structural Reliability of Magnetic Logical Elements Made of Branched Cores"

Metody razrab. radioelektron. apparatury. No 1 (Methods of Developing Radio Electronic Equipment. No 1), Moscow, 1970, pp 49-54 (from RZh-Avtomatika, Telemekhanika i vychislitelnaya tekhnika, No 9, Sep 70, Abstract No 9B255)

Translation: This article contains an investigation of problems of designing a magnetic logical element permitting realization of all the functions of the algebra of logic or two variables. The logical functions are realized in two cycles: the information recording cycle (magnetization cycle) and the information reading cycle, during which the demagnetizing current is fed. A procedure is presented for designing a magnetic logical element, and the possibility of optimizing its parameters is investigated. A reliability function is introduced the solution of which is realized by iterations. For this purpose, the problem of optimization, for which the algorithm and block diagram of the solution are developed, is formulated. There are two illustrations and a four-entry bibliography.

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USSR UDC 621.791.761.1.052:658.562.64

BEKESHKO, N. A., Candidate of Physical and Mathematical Sciences and
POPOV, Yu. A., Engineer

"Use of Thermography for Nondestructive Testing of Spot Welded Joints"

Moscow, Svarochnoye Proizvodstvo, No 4, Apr 72, pp 55-56.

Abstract: This work studies the possibility of using the thermographic method to test the quality of spot welded joints. The distribution of the temperature fields around spot welds on both sides of the joint was studied as the spot welds were heated by a source of even heat. The thermographic method can reveal defects in spot welds, as well as the diameter of the cast plug. However, further studies are needed to determine the accuracy of testing of spot welds on dissimilar materials of different sheet thicknesses.

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USSR UDC 531.55:521.1

GURMAN, V. I., SALMIN, V. V., POPOV, YU. B., and NIKULIN, A. M.

"Control of Low-Thrust Space Vehicles With Account Taken of Their Motion About the Center of Mass"

Moscow, Tr. Pyatykh Chteniy, Posvyasch. Razrabotke Nauch. Naslediya i Razvitiyu Idey K. E. Tsiolkovskogo. Sekts. "Mekh. Kosmich. Poleta" (Works of the Fifth Lecture Series Devoted to Development of the Scientific Heritage and Development of the Ideas of K. E. Tsiolkovskiy. Series "Mechanics of Space Flight"), 1971, pp 59-67 (from Referativnyy Zhurnal, Mekhanika, No 2, Feb 72, Abstract No 2A73 by G. S. Suvorov)

Translation: An investigation is made of the possibility of realizing some programs of control for the problem of the departure of a space craft with low thrust from the gravitational field of the Earth. The vehicle is assumed to be a solid body of variable mass. Control of movement of the center of mass and of rotation around it is effected by means of two electric-rocket cruise propulsion units. The vehicle is acted upon by the gravitational moment M_{gr} and by the controlling moment M_{contr} of the engine thrust. The acceleration vector lies in the orbital plane, and the motion is regarded only with respect to the pitch theta. Two systems of a space craft with an electric-rocket

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UDC: 576.8.098.3.078.2

USSR

POPOV, Yu. B., Chair of General Hygiene, Khabarovsk Medical Institute

"An Indicator for Rapid Determination of Biochemical Properties of Bacteria"

Moscow, Laboratornoye Delo, No 5, 1970, p 313

Translation: For determination of the biochemical properties of microorganisms, accelerated micromethods are used extensively since they are very fast. The plate method using indicator squares was described in an earlier work; it requires the use of a pH indicator. For this purpose mixtures of indicators are useful, and different mixtures are used for colored-culture media.

In our laboratory we have been using for about a year now an indicator which is prepared as follows. In 100 ml of distilled water we dissolve 5 grams of acid fuchsin and 6.4 grams of sodium hydroxide; this is mixed with 100 ml of 1.6% solution of bromothymol blue in alcohol. The sediment is allowed to settle, and the liquid portion is used in the work. The indicator is red in an acid medium and blue in an alkaline one. The last shades of red disappear at a pH of 7.33, and the last traces of blue at pH of 6.81. Thus the transitional zone occupies 0.52 pH units whereas neutral red and phenol red are associated with a transitional area of 1.2 units and bromothymol blue -- 1.6. At a pH of 7.17, the indicator mixture

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POPOV, Yu. B., Laboratornoye Delo, No 5, 1970, p 313

is grey-blue, and at 6.98 it is grey-red. Because of the small size of the transitional zone, the indicator mixture permits demonstration of acid and alkali production with a high degree of sensitivity. This mixture can also be used as an additive to liquid and solid culture media. But it must be borne in mind that it is self-sterilizing, so that it is best to add it to media that are already sterile (about 2 ml per liter of medium). The indicator mixture may be used as well in titrations by the neutralization method, but it must be borne in mind that the red color does not appear immediately after acid reaction in the medium, but a few seconds later.

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USSR UDC: 519.21

POPOV, Yu. D.

"On Linear Extrapolation of a Plane Discrete Homogeneous Random Field"

Vychisl. i prikl. mat. Mezhved. nauch. sb. (Computational and Applied Mathematics. Interdepartmental Scientific Collection), 1971, vyp. 14, pp 102-111 (from RZh-Kibernetika, No 12, Dec 71, Abstract No 12V235)

Translation: Some general theorems are derived on linear extrapolation of discrete homogeneous fields on a plane. Proofs are given for a decomposition of the sliding summation type for fields with an absolutely continuous spectrum, and for Wold decomposition of the given fields into regular and singular components. A canonical decomposition of the regular field is given and used to solve the problem of linear extrapolation from observations in three quarters of the plane. Necessary and sufficient conditions are proved for regularity of a field Author's abstract.

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USSR UDC: 519.21

POPOV, Yu. D.

"On Linear Extrapolation of a Homogeneous and Isotropic Field From Discrete Observations on the Periphery"

Teoriya veroyatnostey i mat. stat. Mezhved. nauch. sb. (Probability Theory and Mathematical Statistics. Interdepartmental Scientific Collection), 1971, vyp. 4, pp 123-129 (from RZh-Kibernetika, No 12, Dec 71, Abstract No 12V234)

Translation: For homogeneous and isotropic random fields on a plane which are continuous in the mean square, explicit formulas are derived for the problem of linear extrapolation from values at uniformly distributed points on the periphery. Author's abstract.

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ENGINEERING
Aeronautical and Space

USSR

UDC 624.07:534.1

KUCHINSKIY, A. F., POPOV, Yu. G.

"Calculating the Frequencies and Shapes of Natural Torsional Vibrations of Composite and Divided Beams With Concentrated Masses"

Tr. Kazan. aviats. in-ta (Works of Kazan' Aviation Institute), 1972, No. 145, pp 56-62 (from RZh-Mekhanika, No 3, Mar 73, Abstract No 3V287)

Translation: A method is presented for finding the frequencies and shapes of intrinsic torsional vibrations of complex multimass systems by compiling them from elementary segments of a beam containing a load in the ratio 2:1. Equations are obtained for determining frequencies and shapes of torsional vibrations of a system consisting of two segments of a beam in terms of the frequencies and shapes of oscillations of the component parts. By consecutive application of these equations for the connection of individual parts of the system, beginning with elementary parts, one can obtain the complete spectrum of the frequency and shapes of oscillations of any multimass system, including a branched system. Authors' abstract.

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USSR

UDC:629.78.015.4

KUCHINSKIY, A.F. and POPOV, YU.G.

"On Calculation of Natural Frequencies and Modes of Vibration of Compound and Ramified Shafts With Concentrated Masses"

Kazan', Tr. Kazan. Aviats. In-ta (Transactions of Kazan' Aviation Institute), 1972, vyp 145, pp 56-62 (from Referativnyy Zhurnal-Raketostroyeniye, 1973, Abstract No 4.41.188)

Translation: A method is proposed for determining the natural frequencies and modes of torsional vibrations of compound multimass systems by dividing them into elements containing one or two masses each. Equations are obtained for determining the frequencies and modes of torsional vibrations of a system, consisting of two sections of shaft, if the frequencies and modes of vibration of the components are known. By successive application of these equations for connecting the system components, beginning with elements, it is possible to obtain a complete spectrum of natural frequencies and modes of vibration of any multimass system, including a ramified one. 2 illustrations. 1 table. 2 references. Author's resume.

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1/2 033 UNCLASSIFIED PROCESSING DATE--20NOV70

TITLE--RECOMBINATION OF NONEQUILIBRIUM CURRENT CARRIERS IN P,INDIUM ANTIMONIDE AT TEMPERATURES BELOW 77DEGREESK -U-

AUTHOR-(04)-GUSEINOV, E.K., NASLEDOV, D.N., PENTSOV, A.V., POPOV, YU.G.

COUNTRY OF INFO--USSR

SOURCE--FIZ. TEKH. POLUPROV. 1970, 4(1), 179-85

DATE PUBLISHED--------70

SUBJECT AREAS--PHYSICS, CHEMISTRY

TOPIC TAGS--INDIUM ANTIMONIDE, ELECTRON RECOMBINATION, LOW TEMPERATURE EFFECT, TEMPERATURE DEPENDENCE, PHOTOCONDUCTIVITY, PHOTOMAGNETIC EFFECT, ELECTRON HOLE, ELECTRON TRAPPING, SEMICONDUCTOR CARRIER

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1983/1307 STEP NO--UR/0449/70/004/001/0179/0185

CIRC ACCESSION NO--AP0054641

UNCLASSIFIED

2/2 033 UNCLASSIFIED PROCESSING DATE--20NOV70

CIRC ACCESSION NO--AP0054641

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE TEMP. DEPENDENCES OF ELECTRON AND HOLE LIFETIMES IN P,TYPE INSB WERE INVESTIGATED AT SMALLER THAN 77DEGREESK BY MEASURING THE STATIONARY PHOTOCOND., THE PHOTOMAGNETIC EFFECT, AND THE PHOTOCOND. RELAXATION. WHEN THE HOLE CONCN. DECREASES, THE SHALLOW ACCEPTOR LEVEL, E SUBNU PLUS 8 TIMES 10 PRIME NEGATIVE3 EV, HAS A SUBSTANTIAL EFFECT ON RECOMBINATION. AT THE SAME TIME, THE HOLE LIFETIME DECREASES EXPONENTIALLY AND THE ELECTRON LIFETIME INCREASES BY NEARLY 1 ORDER. THE COEFF. OF ELECTRON TRAPPING IN THIS LEVEL IS 2 TIMES 10 PRIME NEGATIVE6 CM PRIME3-SEC. THE HEATING OF ELECTRONS BY LIGHT HAS AN ESSENTIAL EFFECT ON RECOMBINATION.

UNCLASSIFIED

(3)

USSR

UDC 621.375.82

GIAZER, A. A., NIKITINA, T. F., PANTELEYEV, V. I., PLOTNIKOV, A. F., POPOV, YU. M., POTAPOV, A. P., SELEZNEV, V. N., TAGIROV, R. I., and SHUR, YA. S.

"Using GaAs and Nd Lasers for Optical Writing on MnBi Film"

Kratkiye Soobshch. po fiz. (Brief Communications on Physics) No 12, 1972, pp 9-12 (from RZh-Fizika, No 7, 1973, Abstract No 7D1088)

Translation: The possibility of using a GaAs semiconductor laser for recording information on a ferromagnetic film of MnBi is experimentally investigated. MnBi film 700 Å thick, which has undergone condensation in a vacuum on glass substrates of 0.1-0.2 mm in thickness, is used. For recording information, a GaAs laser with a threshold current of 2 amp at 77° K and a p-n junction width of 400 μ is used. It is shown that the laser's minimum pumping current at which recording is possible is 80 amp, whereas the radiation power is 20 w. The energy density of the radiation on the film is then $6 \cdot 10^{-9}$ j/μ². With a monopulse neodymium laser, an evaluation of an information recording density equal to 2500 lines/cm is made. It is noted that the use of a semiconductor laser with a junction width not exceeding 20 μ permits reducing the power to a fraction of a watt. Bibliography of four.

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USSR Rpt 13 Sep 69

POPOV, YURIY MIKHAYLOVICH, head of the sector of semiconductor lasers, Dr of Physical and Mathematical Sciences, and Lenin Prize Winner, was interviewed at the Physics Institute of the AS USSR imeni P. N. Lebedev on the use of lasers in telephone communications.

Sotsialisticheskaya Industriya, 13 Sep 69, p 4, cols 1-3 (1)

USSR Rpt 28 Jan 73

BASOV, N. G., Academician; Head, Quantum Radiophysics Laboratory, Physical Institute im. Lebedev, AS, USSR; Lenin and Nobel prizes winner,
KROKHIN, O. N., Doctor, Physical-Mathematical Sciences,
KOVALEVSKIY, D. V., Dep Head of the Laboratory,
ZUYEV, V. S., Doctor, Physical-Mathematical Sciences, and
POPOV, Yu. M., Doctor, Physical-Mathematical Sciences, are shown in a photo (left to right).

Moskovskaya Pravda, 28 Jan 73, p 3, col 6

(5)

AUTHOR: Pushcharovskiy, Yu.M. 11-1-25/29

TITLE: Convention for the Preparation of Unified Stratigraphic Charts for the North-Eastern Regions of the USSR (Soveshchaniye po razrabotke unifitsirovannykh stratigraficheskikh skhem severo-vostoka SSSR)

PERIODICAL: Izvestiya Akademii Nauk SSSR, Seriya Geologicheskaya, 1958, # 1, pp 112-114 (USSR)

ABSTRACT: A large interdepartmental convention for the preparation of unified stratigraphical schemes of the north-east of the USSR was held at Magadan from May 10 to 21, 1957. Great achievements were made by Dal'stroy during the past 15-20 years in the study of the geologic structure of this vast territory. Besides geologists from Dal'stroy, the convention was attended by 239 representatives of geologic institutes of the USSR Academy of Sciences, the Ministry of Geology and Conservation of Natural Resources and other institutions. Lectures were held by the following geologists: A.A. Nikolayev, A.V. Zimkin, Yu.M. Popov, I.I. Tuchkov, A.G. Pogozhev, A.I. Semeykin, G.G. Popov, A.F. Yefimova, V.A. Titov, A.P. Vas'kovskiy and others. The convention decided that the deposits of all stratigraphic systems have to be studied

Card 1/2

Convention for the Preparation of Unified Stratigraphic Charts for the North-Eastern Regions of the USSR

systematically. The necessity of preparing field paleontologic maps for the Paleozoic and Mesozoic periods was stressed at the convention.

AVAILABLE: Library of Congress

Card 2/2

USSR UDC 535.374

BASOV, N. G., DANILYCHEV, V. A., MOLCHANOV, A. G., POPOV, YU. M., and KHODKEVICH, D. D., Physics Institute imeni P. N. Lebedev, Academy of Sciences USSR

"Lasers Using the Luminescence of Self-Trapped Excitons in Condensed Inert Gases"

Moscow, Izvestiya Akademii Nauk SSSR, Seriya Fizicheskaya, Vol 37, No 3, 1973, pp 494-497

Abstract: The article considers a scheme for the population of the working levels and conditions for the generation of vacuum UV radiation in condensed inert gases excited by a fast electron beam. Experimental data are given on the laser coherence and the efficiency of the conversion of the electron beam energy to radiative energy in liquid xenon.

1/1

USSR UDC 621.375.82

ALEKSANYAN, A. G., POLUEKTOV, I. A., POPOV, Yu. M.

"Light Amplification Coefficient in Highly Doped Semiconductors"

V sb. Kvant. elektronika (Quantum Electronics -- Collection of Works), No. 2, Moscow, "Sov. radio", 1972, pp 77-83 (from RZh-Fizika, No 10, Oct 72, Abstract No 10D987)

Translation: The light amplification coefficient was calculated for interzonal transitions in a semiconductor under conditions of high doping. Analytical expressions were obtained for the Fermi quasi levels of electrons and holes which are applicable over a wide range of temperatures and admixture concentrations. The qualitative features of the results are discussed. Examples of a calculation of laser threshold characteristics for this type of optical transition are given. 12 ref. Authors abstract.

APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002202520003-5"

USSR

UDC 621.375.82

BASOV, N. G., DANILYCHEV, V. A., POPOV, Yu. M.

"Induced Radiation in the Region of the Vacuum Ultraviolet"

V sb. Kvant. elektronika (Quantum Electronics -- Collection of Works), No. 1, Moscow, 1971, pp 29-34 (from RZh-Fizika, No 7, Jul 71, Abstract No 7D1061)

Translation: The possibility of obtaining generation in the vacuum region of the spectrum under excitation of condensed noble gases by an electron beam is discussed. Generation was obtained experimentally in liquid xenon at a wavelength of 1760 Å under excitation by an electron beam with an energy of 800 kev. The threshold density of the current was determined (30-50 a/cm^2), and the directionality of the radiation (~7°) and the half-width of the generation spectrum (~20 Å) were measured. 17 ref. Authors abstract.

1/1

Molecular Physics

USSR

UDC 621.378.335

BASOV, N. G., DANILYCHEV, V. A., POPOV, Yu. M.

"Induced Radiation in the Vacuum Ultraviolet Region"

Moscow, Kvantovaya Elektronika, No. 1, 1971, pp 29-34

Abstract: The possibilities of achieving generation in the vacuum region of the spectrum by the excitation of condensed noble gases by an electron beam are discussed. It is noted that the basic difficulty in producing generation in the short-wave portion of the spectrum is the absence of selective and sufficiently effective pumping sources for high energy levels and breakdown into a large number of radiation oscillators, which increases in proportion to the square of the frequency and leads to a decrease in the radiation lifetime. Other difficulties are wide radiation bands and fast relaxations of excited states. In an experiment with liquid xenon, generation was obtained at a wavelength of 1760 Å through excitation by an electron beam with an energy of 800 kev. The threshold density of the current was 30-50 a/cm^2, the half-width of the generation spectrum was ~20 Å, and the direction of the radiation was ~7°. Intense radiation of liquid xenon was also observed in the visible and near ultraviolet regions of the spectrum

USSR

BASOV, N. G., et al, Kvantovaya elektronika, No. 1, 1971, pp 29-34

under the action of a powerful electron beam. Radiation in this range is attributed to transitions between upper excited states of the atoms and xenon molecules and to recombination through structural defects arising in the homogeneous liquid close to the point of the phase transition under the action of fast electrons. The radiation power in the vacuum region of the spectrum was of the order of 10^3 w. It is expected that this can be raised considerably through the application of a better geometry, high quality mirrors, and careful cleaning of the xenon. The authors feel that the excitation of condensed noble gases by a powerful electron beam opens up great possibilities for developing sources of coherent radiation in the vacuum region of the spectrum.

2/2

USSR UDC: 721.373:530.145.6

BASOV, N. G., DANILYCHEV, V. A., POPOV, Yu. M.

"Forced Emission in the Vacuum Ultraviolet Region"

V sb. Kvant. elektronika (Quantum Electronics--collection of works), No 1, Moscow, 1971, pp 29-34 (from RZh-Radiotekhnika, No 6, Jun 71, Abstract No 6D132)

Translation: The paper discusses the possibility of achieving emission in the vacuum region of the spectrum with excitation of condensed noble gases by an electron beam. Emission is experimentally produced in liquid xenon on a wavelength of 1760 Å. Excitation was by a beam of electrons with an energy of 800 keV. The threshold current density is determined (30-50 A/cm^2) and measurements are made of the directivity of the emission (~7°) and the half-width of the emission spectrum (~20 Å). Three illustrations, bibliography of seventeen titles. Resumé.

1/1

USSR

BASOV, N. G., DANILYCHEV, V. A., POPOV, Yu. M., and KHODKEVICH, D. D., Physics Institute imeni P. N. Lebedev, Academy of Sciences USSR

"Laser in the Vacuum Region of the Spectrum from the Excitation of Liquid Xenon by an Electron Beam"

Moscow, Pis'ma Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, Vol 12, No 10, 20 Nov 70, pp 473-474

Abstract: Experiments to obtain generation in liquid zenon in the vacuum region of the spectrum under excitation by a powerful beam of fast electrons (electron current density up to 200 amp·cm^{-2}) are described. The use of condensed inert elements (Xe, Kr, Ar, Ne, He) to generate in the region of the vacuum ultraviolet was proposed and discussed earlier by the authors, and the development of a laser of condensed inert gases was facilitated by the possibility of achieving a four-level scheme. In previous experiments on the excitation of condensed inert gases and their mixtures by fast electrons the luminescence spectra were observed, the effectiveness of luminescence was evaluated, and weak induced radiation of liquid xenon at the wavelength ~1760 Å was observed. These experiments were made without mirrors and at a low excitation density (maximum electron current density

USSR

BASOV, N. G., et al, Pis'ma Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, Vol 12, No 10, 20 Nov 70, pp 473-474

(maximum electron current density was 25 amp·cm^{-2}). In this study the radiation spectrum of liquid xenon was measured for two values of the pumping current density: 150 amp·cm^{-2} and 70 amp·cm^{-2}. At electron current densities of more than 100 amp·cm^{-2} the intensity of the 1760 Å line strongly increases and the half-width of the line reaches 20 Å, which is close to the resolution of the spectrometer, while the half-width of this line at low excitation density was 80 Å. Semitransparent aluminum mirrors deposited on a substrate of lithium fluoride and coated with a protective layer of magnesium fluoride were used as mirrors. It is noted that the application of other inert gases in the condensed state should permit induced radiation over a wide range of wavelengths up to 800 Å.

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1/2 046 UNCLASSIFIED PROCESSING DATE--04DEC70

TITLE--A COMPOSITE RESONATOR FOR SEMICONDUCTOR LASERS -U-

AUTHOR-(02)-POPOV, YU.M., SHUYKIN, N.N.

COUNTRY OF INFO--USSR

SOURCE--FIZIKA I TEKHNIKA POLUPROVODNIKOV, VOL. 4, JAN. 1970, P. 45-50

DATE PUBLISHED-----JAN70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--SEMICONDUCTOR LASER, RESONATOR, LASER POWER OUTPUT, LASER EXCITATION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1992/1447 STEP NO--UR/0449/70/004/000/0045/0050

CIRC ACCESSION NO--AP0112441

UNCLASSIFIED

2/2 046 UNCLASSIFIED PROCESSING DATE--04DEC70
CIRC ACCESSION NO--AP0112441
ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. CONSIDERATION OF THE CONDITIONS OF EXCITATION OF AXIAL MODES IN A COMPOSITE SEMICONDUCTOR LASER RESONATOR FOR THE PURPOSE OF INCREASING SINGLE MODE POWER GENERATION, A SIMPLE EXPRESSION IS OBTAINED WHICH RELATES THE OPTIMAL LENGTH OF THE PASSIVE PART O THE RESONATOR TO THE PARAMETERS OF THE INITIAL SEMICONDUCTOR LASER. IT IS SHOWN BY CALCULATIONS THAT WITH THE AID OF A COMPOSITE RESONATOR IT IS POSSIBLE TO INCREASE THE SINGLE MODE POWER GENERATION OF A SEMICONDUCTOR LASER BY A FACTOR OF 10 TO 50 WHEN THE LENGTH OF THE ACTIVE PART OF THE RESONATOR RANGES FROM 50 TO 500 MICRONS.
FACILITY: AKADEMIIA NAUK SSSR, FIZICHESKII INSTITUT, MOSCOW, USSR.

UNCLASSIFIED

USSR

UDC 535.345.1

LISOVETS, YU. P., POLUEKTOV, I. A., POPOV, YU. M., ROYTBERG, V. S.

"Passage of a Coherent Ultrashort Light Pulse Through a Semiconductor"

Moscow, Kvantovaya Elektronika, No 5, 1971, pp 28-36

Abstract: Resonance interaction of an ultrashort coherent light pulse with a semiconductor, when the pulse duration is less than the polarization relaxation time or the "phase memory" of the medium, is discussed. The possibility of the existence of the effect of self-transparency under interzone transitions in semiconductors is first considered. This effect means that under certain conditions powerful ultrashort light pulses propagate practically without energy dissipation through an absorbing medium which becomes transparent for them. The medium then consists of a set of "two-level" atoms or molecules which have an allowed dipole transition in resonance with the carrier frequency of the pulse and which interact with one another only through the radiation field. The problem of the interaction of a coherent light pulse with a semiconductor is analyzed in detail, and conditions ensuring the passage of a pulse without energy losses i.e., self-transparency are determined. It is shown that under certain conditions the formation of a steady-state 2π-pulse is possible.

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USSR

LISOVETS, YU. P., et al., Kvantovaya Elektronika, No 5, 1971, pp 28-36

Numerical values of the rate of propagation of a stable pulse are obtained for characteristic values of semiconductor parameters. It is observed that under conditions characteristic of many semiconductors the self-transparency effect is possible in principle, and the stationary pulse that arises can move at a speed that is an order of magnitude less than the ordinary speed of light in the given material.

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USSR

UDC 621.373.5

ALEKSANYAN, A. G., POLUEKTOV, I. A., and POPOV, YU. M.

"The Influence of Impurity Concentration on the Threshold Characteristics of Semiconductor Lasers"

Moscow, Kvantovaya Elektronika, No 3, 1971, pp 15-22

Abstract: This article first summarizes previous research on the stated problem and then proceeds to examine the threshold characteristics of semiconductor lasers as a function of the degree of doping and temperature in the model of optical transitions from the parabolic conduction band to the impurity acceptor band with a gaussian distribution of the state density. The authors have computed the amplification factor and the rate of spontaneous recombination; they also found the dependence of the threshold current, the Fermi quasi-levels, and the generation frequency of the semiconductor laser on the impurity concentration and temperature. Formulas and graphs are used to demonstrate their findings and show the influence of impurity concentration on threshold characteristics. The results obtained in this article may also be used to investigate the threshold characteristics of semiconductor lasers excited optically and electronically. It is necessary only to redefine the meaning of the term Q as the number of electron-hole pairs created

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APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002202520003-5"

USSR

ALEKSANYAN, A. G., et al., Kvantovaya Elektronika, No 3, 1971, pp 15-22

per unit of time per unit of volume by extrinsic radiation or the electron beam, respectively, and to connect the value of Q with the extrinsic pumping. The article contains 5 figures and a bibliography of 25 entries.

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USSR

POPOV, Yu. M., Physics Institute imeni P. N. Lebedev, Academy of Sciences of the USSR

"Concerning the Laser Based on Manganese Centers in Zinc Sulfide"

Moscow, Pis'ma v Zhurnal Eksperimental'noy i Teoreticheskoy Fiziki, Vol 16, No 1, 5 Jul 72, pp 3-4

Translation: A previous paper (N. A. Vlasenko, Zh. A. Nukhliy, Pis'ma v ZhETF, Vol 14, p 449, 1971) reported on development of a new type of optical maser utilizing impact excitation of manganese centers in a zinc sulfide lattice by current carriers heated by an applied electric field.

However, the experimental values of the current density j ($\sim 10^{-2}$ A·cm^{-2}) and electric field strength E (10^6-10^7 V·cm^{-1}) cited by the authors cannot give a gain of $\alpha \sim 10^3$ cm^{-1} in view of the following considerations:

In the case of luminescent centers, gain is related to spontaneous emission time τ_r by the well-known expression

USSR

POPOV, Yu. M., Pis'ma v ZhETF, Vol 16, No 1, Jul 72, pp 3-4

$$\alpha = \frac{\Delta N n}{c\tau_r \rho_\lambda \Delta\lambda}, \qquad (1)$$

where ΔN is the inverse population, $\rho_\lambda \Delta\lambda$ is the number of oscillation radiators in the half-width of the spontaneous emission line $\Delta\lambda$ in cm^{-3}, c is the speed of light, and n is the index of refraction of the medium.

The power of spontaneous emission with cm^{-3} P_r satisfies the following relation:

$$P_r \geq \hbar\omega \frac{\Delta N}{\tau_r}.$$

Expressing $\Delta N/\tau_r$ from (1), we get:

$$P_r \geq \frac{16\pi^2 \hbar c^2 n^2 \alpha}{\lambda^4} \cdot \frac{\Delta\lambda}{\lambda}, \qquad (2)$$

where λ is the wavelength at the maximum of spontaneous emission ($\lambda \sim 5900$ Å, $\Delta\lambda \sim 700$ Å).

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USSR

POPOV, Yu. M., Pis'ma v ZhETF, Vol 16, No 1, Jul 72, pp 3-4

Substituting the experimental values given by Vlasenko and Nukhliy in formula (2) gives a value of more than 10^9 $W \cdot cm^{-3}$, whereas the pumping power in the experiment was $jE \sim 10^4$-10^5 $W \cdot cm^{-3}$; i. e., a power which could not possibly provide the spontaneous emission power for a gain of $\alpha \sim 10^3 cm^{-1}$.

3/3

USSR

UDC: 621.378.33+535.345.1

ALEKSANYAN, A. G., POLUEKTOV, I. A., POPOV, Yu. M.

"Light Amplification Factor in Heavily Doped Semiconductors"

Moscow, Kvantovaya Elektronika, Sbornik Statey, No 2(8), 1972, pp 77-83

Abstract: The coefficient of light amplification is computed for transitions between bands in a semiconductor under conditions of heavy dopant injection. Analytical expressions are found for the Fermi quai-levels of electrons and holes, applicable over a wide range of temperatures and dopant concentrations. The qualitative particulars of the results are discussed. Examples are given of calculation of the laser threshold characteristics for the given type of optical transitions. The authors thank P. G. Yeliseyev for constructive criticism. Two illustrations, bibliography of twelve titles.

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USSR

UDC 629.124.791.07

POPOV, YU. N., TEGKAYEVA, T. KH., and FADEYEV, O. V.

"Influence of the Shape of Icebreaker Contours Upon the Value of Ice Loads"

Leningrad, Ledovyye Kachestva Sudov (Ice Properties of Ships), Gidrometeoizdat, 1973, pp 79-87

Abstract: An analysis is made of the influence of the shape of icebreaker hull contours upon the value of ice loads. Formulas and graphs are presented, which illustrate the relationship of the value of the ice loads upon an icebreaker hull, including the structural components and the cladding, to the angle of inclination of the ribs, the completeness coefficient of the bow area of the waterline, and the length-to-beam ratio of the hull. It is shown that the shape of the hull contours affects to a considerable degree the value of the impact loads originating in the bow of the hull. 4 figures. 1 table. 2 references.

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USSR

UDC 533.95:538.4

3

SAMARSKIY, A. A., Corresponding Member of the Academy of Sciences USSR, KURDYUMOV, S. SP., KULIKOV, YU. N., LESKOV, L. V., POPOV, YU. P., SAVICHEV, V. V., and FILIPPOV, S. S., Institute of Applied Mathematics, Academy of Sciences USSR, Moscow

"Magnetohydrodynamic Model of Unsteady Plasma Acceleration"

Moscow, Doklady Akademii Nauk SSSR, Vol 206, No 2, 1972, pp 307-310

Abstract: During an experimental study of pulsed plasma accelerators, some physical phenomena were discovered which cannot be explained within the framework of existing simplified models: viz., the existence of a laminated structure for the ejected plasma formation, motion counter to the accelerating ampere force, the presence of high-multiplicity ions in the plasma, heating up of the plasma to high temperatures in narrow sections, etc. Therefore, the authors undertook to calculate the dynamics of plasma formations in pulsed accelerators, with allowance for the spatial distribution of the physical characteristics of the plasma, radiation, and nonlinear effects in the plasma. As a result of computer-aided calculations, density, velocity, temperature,

USSR

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SAMARSKIY, A. A., et al., Doklady Akademii Nauk SSSR, Vol 206, No 2, 1972, pp 307-310

current, and the magnetic field along the direction of motion were determined. It is shown that there are nonlinear mechanisms leading to the appearance of heated current layers (T-layers) in the medium, separated by intervals of relatively cold gas. The T-layers evolve and generate shock waves which propagate on both sides, and this leads in turn to the production of new T-layers, the formation of plasma clusters and their interaction, the return motion of the substance, and the appearance of closed current loops in the plasma. A study is made of the energy balance in the accelerator and the time redistribution of individual forms of energy.

2/2

1/2 026 UNCLASSIFIED PROCESSING DATE--04DEC70

TITLE--COMPLETELY CONSERVATIVE DIFFERENCE SCHEMES FOR THE GASDYNAMICS EQUATIONS IN EULER VARIABLES -U-

AUTHOR-(02)-POPOV, YU.P., SAMARSKIY, A.A.

COUNTRY OF INFO--USSR

SOURCE--ZHURNAL VYCHISLITEL'NOI MATEMAITKI I MATEMATICHESKOI FIZIKI, VOL. 10, MAY-JUNE 1970, P. 773-779

DATE PUBLISHED--------70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--DIFFERENCE METHOD, GAS DYNAMICS, INDEPENDENT VARIABLE, APPROXIMATION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY FICHE NO----FD70/605007/D03 STEP NO--UR/0208/70/010/000/0773/0779

CIRC ACCESSION NO--AP0139876

UNCLASSIFIED

2/2 026 UNCLASSIFIED PROCESSING DATE--04DEC70

CIRC ACCESSION NO--AP0139876

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. CONSTRUCTION OF COMPLETELY CONSERVATIVE DIFFERENCE SCHEMES WITH FIRST AND SECOND ORDERS OF APPROXIMATION FOR THE GASDYNAMICS EQUATIONS IN EULER VARIABLES. THESE CONSERVATIVE DIFFERENCE SCHEMES HAVE CERTAIN QUANTITATIVE ADVANTAGES OVER OTHER SCHEMES OF THE SAME ORDERS OF APPROXIMATION IN THE CASE OD DISCONTINUOUS AND HIGHLY VARYING SOLUTIONS. IN PARTICULAR, IN CONTRAST TO OTHER SCHEMES, THE IMBALANCES IN COMPLETELY CONSERVATIVE SCHEMES ARE EXACTLY EQUAL TO ZERO.

UNCLASSIFIED

USSR

POPOV, Yu. P., and SAMARSKIY, A. A., Moscow

"Fully Conservative Difference Schemes for the Equations of Magnetohydrodynamics"

Moscow, Zhurnal Vychislitel'noy Matematiki i Matematicheskoy Fiziki, Vol 10, No 4, Jul/Aug 70, pp 990-998

Abstract: Difference schemes for the equations of magnetohydrodynamics in Lagrange mass coordinates are considered for the case of one space variable, and fully conservative difference schemes are constructed with a first and second order of approximation. It is noted that ordinary difference schemes, including conservative schemes, which are used to approximate a system of gasdynamic equations have the shortcoming that the energy balance relationships break down. A so-called "fully conservative" class of schemes which are free from this defect is described. Not only are the difference analogs of the fundamental laws for the conservation of mass, momentum, and total energy fulfilled, as for ordinary conservative schemes, but also a detailed energy balance holds: i.e., a balance in terms of individual forms of energy - internal and kinetic. A fully conservative difference scheme can be obtained by an integro-interpolation method with the observance of a certain formal selection rule. The energy equation in gasdynamics can be described in different forms: a divergent form describing the

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USSR

POPOV, Yu. P., and SAMARSKIY, A. A., Zhurnal Vychislitel'noy Matematiki i Matematicheskoy Fiziki, Vol 10, No 4, Jul/Aug 70, pp 990-998

change of the total energy in time, a nondivergent form expressing the change in internal energy, and an entropy form. These forms are equivalent in the differential form: i.e., They reduce to one another with the aid of the remaining equations of the system. In the difference form this property of equivalence generally does not occur and holds only for fully conservative schemes: fully conservative difference schemes simultaneously approximate the possible equivalent forms of the initial differential system of equations. Fully conservative difference schemes approximating the system of equations of magnetohydrodynamics were used in calculating a high-current discharge in plasma. The calculations show that a complex magnetohydrodynamic flow arises with large spatial gradients and sharp changes in the parameters with time. A calculation of this problem by ordinary implicit schemes with nondivergent energy equations gave an imbalance in the total energy which was, in certain cases, 20-50% of the total energy of the system; this yielded the physically absurd result that the energy coming from the system in the form of optical radiation exceeded the initial energy supply in the capacitor bank by the end of the process. The application of fully conservative schemes avoided this defect.

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USSR

UDC: 621.384.6.5

ARZUMANOV, A. A., NEMENOV, L. M., ANISIMOV, O. K., BATALIN, S. S., VOLKOV, B. A., GROMOV, D. D., KRAVCHENKO, Ye. T., KRUGLOV, V. G., NIGMATOV, M. Kh., POPOV, Yu. S., PROKOV'YEV, S. I., and RYBIN, S. N.

"Isochronic Cyclotron With Controllable Ion Energy"

Alma-Ata, Izvestiya AN KazSSR--Teriya Fiziko-matematicheskaya, No 4, 1973, pp 6-15

Abstract: A discussion of the isochronic cyclotron with controllable ion energy built around the U-150-2 accelerator installed in the Institute for Nuclear Physics of the Kazakh SSR Academy of Sciences in 1965 is given. Calculations of the fundamental parameters made with an electronic computer are presented, together with the results of a theoretical analysis, a large part of which was based on approximation methods. These results were verified by a numerical method. The description is given of a program developed for investigating and modeling the magnetic field on a mock-up with a scale of 1:3. An outline drawing of the magnetic arrangement is given, along with curves of the magnetic field. The current correction for the magnetic field is explained, with an illustrative photograph of the correction winding. Also discussed are the

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(8)

USSR UDC: 631.384.6.5

ARZUMANOV, A. A., et al, Izvestiya AN KazSSR--Teriya Fiziko-matematicheskaya, No 4, 1973, pp 6-15

high-frequency system and the slit-type ion source, the ions entering the accelerator chamber radially. Curves for the change in beam intensity for accelerated alpha particles are plotted as a function of the accelerator radius. A photograph of the area of installation, showing a beam of protons in air with an energy of 30 Mev, is reproduced together with a photograph of the equipment itself.

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1/2 028 UNCLASSIFIED PROCESSING DATE--23OCT70

TITLE--SURFACE STATES OF GERMANIUM AND SILICON UNDER SILICON DIOXIDE FILMS APPLIED USING HIGH FREQUENCY GAS DISCHARGE PLASMA -U-

AUTHOR-(02)-PAVLOV, P.V., POPOV, YU.S.

COUNTRY OF INFO--USSR

SOURCE--FIZ. TEKH. POLUPROV. 1970, 4(3), 569-71

DATE PUBLISHED--------70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--THIN FLIM SEMICONDUCTOR, SILICON DIOXIDE, CRYSTAL SURFACE, PLASMA BEAM INTERACTION, HIGH FREQJENCY DISCHARGE, DISCHARGE PLASMA

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1988/0100 STEP NO--UR/0449/70/004/003/0569/0571

CIRC ACCESSION NO--AP0105186

UNCLASSIFIED

2/2 028 UNCLASSIFIED PROCESSING DATE--23OCT70

CIRC ACCESSION NO--AP0105186

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. BY USING THE METHODS OF AST, ET AL. (CA 59: 3574A) FOR DEPOSITING FILMS OF SIO SUB2 USING HIGH FREQUENCY GAS DISCHARGE PLASMA, SAMPLES WERE PREPD. AND STUDIED FOR EFFECTS OF PLASMA BOMBARDMENT ON THE SEMICONDUCTOR SURFACE. P TYPE GE (RHO EQUALS 38-40 OHM CM) AND P TYPES SI (RHO EQUALS OHM CM) WERE USED AS SUBSTRATES FOR THE DEPOSITION OF SIO SUB2 FILM. THE PRESSURE OF THE AR-O MIXT. IN THE CHAMBER DURING THE APPLICATION OF THE FILM APPEARED TO HAVE THE GREATEST EFFECT ON THE SURFACE STATE. FACILITY: FOR'K. ISSLED. FIZ. TEKH. INST., GORKI, USSR.

UNCLASSIFIED

USSR

UDC:521.719.2:621.378.9

VOLKONSKIY, V. B., NESTEROVA, Z. V., POPOV, Yu. V., CHERNYAYEV, A. I., YAKOVLEV, V. V.

"A Laser Rangefinder with Super-High-Frequency Modulation of Radiation and Frequency Conversion in the Photoreceptor"

Optiko-Mekhanicheskaya Promyshlennost', No 10, Oct 73, pp 22-25

Abstract: In known light rangefinders with SHF modulation of optical radiation, phase detection of the signal received is performed in the light modulator. The operating range of a laser rangefinder can be significantly increased by attaching a reflecting film to the object, the distance to which is to be measured. This article presents the results of experimental studies of a laser rangefinder with SHF amplitude modulation of the radiation, the modulation frequency convertor in the photoreceptor and phase detection at low frequency. The laser uses a helium-neon laser operating at 755 Mhz. The maximum range measurement error when a film reflector is used at a range of 25 m is 0.5 mm, with a signal/noise ratio of at least 10. Automatic recording of the results of measurements on a strip-chart recorder is possible.

1/1

USSR

UDC 535

VAFIADI, V. G., POPOV, Yu. V.

"The Speed of Light and Its Meaning in Science and Technology"

Skorost' sveta i yeye znacheniye v nauke i tekhnike (cf. English above), Minsk, Publishing House of Belorussian State University, 1970, 136 pp., ill., 90 k. (from RZh-Fizika, No 7, Jul 71, Abstract No 7D876)

Translation: The first part of the monograph presents the history of the discovery of the speed of light and modern methods for measuring the speed of electromagnetic waves. The second part is concerned with optical radar: i.e., the description of optical range-finders - devices which measure distances with a high accuracy on the basis of the time required for light to travel over the distance being measured. The book is intended for physicists and geodesists, scientific workers, graduate students, and engineers. 348 ref. Abstract

1/1

Precision Mechanical and Optical

USSR

UDC: 528.519:621.376

Adrianova, I. I., Candidate of Technical Sciences, Asnis, L. N., Vereshchaka, A. I., Nesterova, Z. V., Candidate of Technical Sciences, and Popov, Yu. V., Candidate of Technical Sciences

"Frequency Conversion with Dual Modulation of Light in Light Rangefinders"

Optiko-Mekhanicheskaya Promyshlennost', No 5, 1972, pp 8-11.

Abstract: Nonlinear distortions are studied with dual modulation by polarization, resulting from operating modes of light modulators. It is shown that with the maximum signal at the intermediate frequency, the nonlinear distortions amount to 27%. It is found to be possible to decrease nonlinear distortions by selecting the operating mode of the light modulator and converter. In contrast to the method of the phase detector, in the light modulator studied, the method of conversion of frequency in the modulator is free of errors related to changing position of the plane of polarization of radiation as it propagates from the modulator to the converter. Thus, when the converter is mismatched with the modulator by ±15°, equivalent to rotating the plane of polarization of the radiation by the same angle, the phase error does not exceed the error of the measuring device (±1°). The results produced can be used to select the operating mode

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USSR

Adrianova, I. I., Asnis, L. N., Vereshchaka, A. I., Nesterova, Z. V., and Popov, Yu. V., Optiko-Mekhanicheskaya Promyshlennost', No 5, 1972, pp 8-11.

of an optical radiation modulator and converter in a light rangefinder with frequency conversion and dual light modulation.

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USSR

UDC 528.517:621.378.9

DERYAGIN, V. N., MARASIN, L. YE., POPOV, YU. V., Candidate of Sciences

"Small GDFI-3 Pulse-Phase Laser Range Finder with Digital Output"

Leningrad, Optiko-mekhanicheskaya promyshlennost', No 7, 1972, pp 23-27

Abstract: The GDFI-3 pulse-phase laser range finder is described. It is a further development of a previously described device [V. N. Deryagin, et al., Optiko-mekhanicheskaya promyshlennost', No 6, 27, 1970; No 12, 27, 1970]. The circuitry has been simplified appreciably, and provision has been made for high speed and data output on a digital display. The mathematical description of the method on which the range finder is based, a block diagram of the device and a description of an experimental model are given. Instead of the usually measured interval $\Delta t = 2D/c$, the interval τ_T obtained as a result of linear transformation is measured [$\tau_T = \Delta\varphi T_{intermediate}/2\pi$ where $\Delta\phi$ is the phase shift between the signal and reference voltages, and $T_{intermediate} = 1/F_{intermediate}$]. The test results show that the range to a corner reflector about 100 cm^2 in area is no less than 12 km and to diffusely reflecting objects,~250 meters. The measurement accuracy is $\pm$5 cm.

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TECHNICAL TRANSLATION

FSTC-HT-23-2015-72

ENGLISH TITLE: PROBLEMS OF LASER BEAM DATA TRANSMISSION
PROCEEDINGS OF THE FIRST ALL-UNION CONFERENCE, KIEV, SEPTEMBER 1968

FOREIGN TITLE: PROBLEMY PEREDACHI INFORMATSII LAZERNYM IZLUCHENIYEM

AUTHOR: I. A. DERYUGIN, ET AL.

SOURCE: KIEV ORDER OF LENIN STATE UNIVERSITY IMENI T.G. SHEVCHENKO

Translated for FSTC by ACSI

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Approved for public release: Distribution unlimited.

- Title Page -

1/2 020 UNCLASSIFIED PROCESSING DATE--30OCT70

TITLE--AMPLITUDE FREQUENCY CHARACTERISTICS OF SEMICONDUCTOR SOURCES OF THE SPONTANEOUS RADIATION -U-

AUTHOR-(03)-ZARGARYANTS, M.N., POPOV, YU.V., UTENKOV, B.I.

COUNTRY OF INFO--USSR

SOURCE--LENINGRAD, OPTIKO-MEKHANICHESKAYA PROMYSHLENNOST', NO 2, FEB 70, PP 10-13

DATE PUBLISHED----FEB70

SUBJECT AREAS--PHYSICS

TOPIC TAGS--FREQUENCY CHARACTERISTIC, RADIATION SOURCE, SEMICONDUCTOR CRYSTAL

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1996/1583 STEP NO--UR/0237/70/000/002/0010/0013

CIRC ACCESSION NO--AP0118566

UNCLASSIFIED

2/2 020 UNCLASSIFIED PROCESSING DATE--30OCT70

CIRC ACCESSION NO--AP0118566

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. A THEORETICAL EVALUATION WAS MADE OF THE INERTIAL PROPERTIES OF SEMICONDUCTOR SOURCES OF THE SPONTANEOUS RADIATION. A SATISFACTORY COINCIDENCE WAS OBTAINED OF THE EXPERIMENTAL TESULTS WITH THE CALCULATED ONES.

UNCLASSIFIED

USSR

UDC 528.514

NEVEROV, L. A., KORTEV, N. V., LARIONOVA, T. A., MITROFANOV, V. V., MILASHEVSKIY, A. K., POPOV, YU. V., Candidate of Sciences, RYZHENKO, B. V.

"The New KDG-3 Phototachymeter With Semiconductor Emission Source"

Leningrad, Optiko-mekhanicheskaya Promyshlennost', No 9, Sep 70, pp 35-39

Abstract: The authors describe the operating principle, optical system, construction and test results of the first serially produced phase phototachymeter with gallium arsenide diode as the emission source. The instrument can be used to measure distances of up to 2 km with an error of no more than 15 mm over its entire range. Measurement time is 10-15 minutes. The instrument is equipped with thermostatic control and can be used at temperatures from -50 to +50°C. Power consumption is no more than 5 watts.

USSR

UDC 535.376:621.382

POPOV, Yu. V., SHILOV, A. F., MANAK, I. S., KOBAK, I. A., FIGURIN, V. A.

"Nonuniformity of Glow and Percentage Modulation Lengthwise of P-N Junction in GaAs Diodes"

Vestn. Belorus. un-ta (Bulletin of Belorussian University), 1970, Series 1, No 3, pp 63-64 (from RZh--Elektronika i yeye primeneniye, No 5, May 1971, Abstract No 5B232)

Translation: The results are presented of a study of the nonuniformity of glow and percentage modulation of a p-n junction in GaAs diodes, which can be accounted for by the nonuniformity of distribution of impurities. 2 ill. 4 ref. Summary.

1/1

USSR

UDC: 621.317.742

KABANOV, D. A., POPOV, A. A.

"Evaluating the Noise Properties of Measurement Lines With Discrete Nonhomogeneities"

Dokl. Vses. nauchno-tekhn. konferentsii po radiotekhn. izmereniyam. T. 2 (Reports of the All-Union Scientific and Technical Conference on Radio Engineering Measurements. Vol. 2), Novosibirsk, 1970, pp 36-37 (from RZh-Radiotekhnika, No 12, Dec 70, Abstract No 12A383)

Translation: The authors analyze internal fluctuation noises of a transmission line matched at the boundaries with N equidistant diodes with identical parameters. The method of graphs is used to determine the coefficients of transmission of the noises from their sources to each nonhomogeneity, and the energy spectrum is found on this nonhomogeneity. Expressions are found for the dispersion of the noise voltage for various components (shot noise, etc.). Calculations show that the overall level of the noise voltage with a wave impedance of 50 Ω and N = 20 for series produced pulse diodes is of the order of 50-200 μV. Thermal noises make up the biggest part. Bibliography of four titles. E. L.

1/1

USSR

UDC 621.311.25:621.039.56:621.039.564

POPOV, A. F.

Ekspluatatsiya priborov i regulyatorov na atomnykh elektrostantsiyakh (Operation of Instruments and Regulators at Atomic Electric Power Plants), Atomizdat Press, 1970, 190 pp (from RZh-Teploenergetika, No 2, Feb 71, Abstract No 2U116K)

Translation: This book discusses the problems of operating measuring and control instruments and regulating devices at atomic electric power plants. The basic technological process control schemes for the reactors, specific monitoring devices and the organization of their operation at the atomic electric power plants are described. The servicing and repair procedures and techniques and the procedures used for checking the devices under conditions of ionizing radiation are discussed. There are 43 illustrations and a 35-entry bibliography.

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USSR

UDC 678.742.2-9

POPOVA, A. I., SERENKOV, V. I., and GEFTER, YE. L.,

"Radiation-Chemical Grafting of Organophpsphorus Monomers Onto Polyethylene"

Moscow, Plasticheskiye Massy, No 11, 1971, pp 40-42

Abstract: The authors studied the radiation-chemical grafting of di(β -chloroethyl) ester of vinylphosphonic acid (vinyphos) onto polyethylene, as well as the principal regularities of the grafting process and properties of the graft copolymers. Unstabilized polyethylene film was used for grafting. Specimens underwent gamma irradiation from a Co-60 source. The following questions were studied: the effect of the nature of the solvent (in air) on the degree of grafting (the highest degree of grafting was found with the use of acetone); the effect of solution concentration, dose rate and film thickness onthe yield of graft copolymer during irradiation of films immersed in an acetone solution of vinyphos; the effect of degree of grafting on the physicomechanical indices of film (35 microns thick) from polyethylene-vinyphos copolymer. It was found that the quantity of graft copolymer is proportional to the concentration of vinyphos in acetone to 50 vol. percent, while a further increase in concentration does not affect the yield of graft copolymer. The yield of graft copolymer does not exceed 45-46 percent with an irradiation dose of 40 Mrad for films

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USSR

POPOVA, A. I., et al., Plasticheskiye Massy, No 11, 1971, pp 40-42

35 microns thick. The degree of grafting declines slightly with a film thickness of 70 microns and drops sharply with a thickness of 200 microns. The grafting process is evidently determined by diffusion of the monomer into the polymer. The quantity of graft vinyphos can be increased by themethod of "successive" irradiation.

2/2

USSR

UDC: 681.8.087.92-932

DUBINSKIY, Ya. I., POPOV, A. I.

"An Electropneumatic Proportional-Plus-Integral and Differential Converter"

USSR Author's Certificate No 255681, filed 28 Jan 67, published 9 Mar 70 (from RZh-Avtomatika, Telemekhanika i Vychislitel'naya Tekhnika, No 11, Nov 70, Abstract No 11A136 P)

Translation: This Author's Certificate introduces an electropneumatic proportional-plus-integral and differential converter. The device contains an electromagnetic controlling element with coils connected in a differential circuit, a comparison element, pneumatic capacitors, adjustable chokes, and a pneumatic divider. To improve reliability, the armature of the electromagnetic element is securely fastened to the rod of the comparison element. The output channel of the comparison element is connected respectively through a divider to the first negative feedback chamber and, through a choke and capacitance, to the second and first positive feedback chambers and, at the same time, through a choke and capacitance to the second positive feedback chamber. The forces developed by the difference in currents flowing through the coils of the comparison element are balanced by the forces developed by the action of air pressure on the negative and positive feedback diaphragms.

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USSR

DUBINSKIY, Ya.I., POPOV, A.I., USSR Author's Certificate No 255681

The variation in the pneumatic output signal is determined by pneumatic inertial links included in the feedback circuits. One illustration.

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USSR

UDC 678.84.019.86

BELOVA, V. V., PRIDACHINA, N. N., POPOVA, A. I., and SERENKOV, V. I.

"Radiolysis of Polysiloxane Resin"

Moscow, Plasticheskiye Massy, No 3, 1971, pp 24-26

Abstract: Structural rearrangements occurring in solidified silicon organic resin under the influence of ionizing radiation were studied by IR spectroscopy, mass-spectroscopy, thermomechanical, and physicomechanical techniques. Polymethylsiloxane resin is formed by cohydrolysis of methyltrichlorosilane and dimethyldichlorosilane yielding cyclic polymers with silsesquioxane bonds. It was determined that radiation leads to further structuralization of already solidified polymer. This is due to the formation of new ≡Si-O-Si≡ bonds, methylene and ethylene bridges and changes in the cyclic structure pattern of the polymer. These polymers become more durable because of the disappearance of organic radicals and increase in the number of trimer cycles. Temperature increase during radiolysis enhances the rate and degree of these processes.

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1/2 017 UNCLASSIFIED PROCESSING DATE--23OCT70

TITLE--ENERGY DISTRIBUTION OF ALPHA PARTICLES FROM THE P PLUS PRIMELI B YIELDS 3 ALPHA REACTION -U-

AUTHOR-(05)-KOMAROV, V.V., ~~BOROVA~~, A.M., ROMANOVSKIY, YE.A., KALACHEVA, Z.F., SALMAN, KH.

COUNTRY OF INFO--USSR

SOURCE--IZV. AKAD. NAUK SSSR, SER. FIZ. 1970, 34(1), 84-8

DATE PUBLISHED--------70

SUBJECT AREAS--PHYSICS, NUCLEAR SCIENCE AND TECHNOLOGY

TOPIC TAGS--ENERGY SPECTRUM, ALPHA SPECTRUM, PROTON BOMBARDMENT, BORON ISOTOPE, CARBON ISOTOPE, EXCITED NUCLEUS, CALCULATION

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--1988/0207 STEP NO--UR/0048/70/034/001/0084/0088

CIRC ACCESSION NO--AP0105283

UNCLASSIFIED

2/2 017 UNCLASSIFIED PROCESSING DATE--23OCT70

CIRC ACCESSION NO--AP0105283

ABSTRACT/EXTRACT--(U) GP-0- ABSTRACT. THE CALCN. IS DEMONSTRATED OF THE WIDTH OF A 2 PARTICLE ALPHA ALPHA RESONANCE (L PRIMEPI EQUALS 2POSITIVE), APPEARING IN THE ENERGY DISTRIBUTIONS OF THE ALPHA PARTICLES IN THE REACTION P PLUS PRIME11 B YIELDS 3 ALPHA WHICH OCCURS THROUGH THE STATES 1 MINUS AND 0 POSITIVE OF THE PRIME12 C NUCLEUS (E EQUALS 17.23 AND 17.77 MEV). THE CALCD. VALUES AGREE VERY WELL WITH THE EXPTL. DATA OBTAINED FROM THE EXPTS. WITH THE ENERGY OF THE INCIDENT P 1.7 AND 2.0 MEV, RESP.

UNCLASSIFIED

USSR

UDC 615.214.31.015.4:612.823.5

POPOVA, E. N., VAVILOV, A. M., KRIVITSKAYA, G. N., and TUMANOV, V. P., Brain Institute and Institute of Surgery imeni A.V.Vishnevskiy, Academy of Medical Sciences USSR, Moscow

"Effect of Amphetamine Sulfate on the Structure of Interneuronal Connections"

Moscow, Zhurnal Nevropatologii i Psikhiatrii, No 3, 1973, pp 382-387

Abstract: Intraperitoneal injection of rats with 1 mg/kg of amphetamine sulfate had little effect on the dendrites of most neurons in the caudate nucleus or cerebral cortex. Following a dose of 2.5 mg/kg, a dense network of fibrils of different sizes was seen in slices from the caudate nucleus stained with silver by Golgi's method. Along the thinnest fibrils could be seen varicosities of irregular shape and size that stained more intensely with silver. The number of spines per unit of dendrite length increased markedly. In this axonal network were intertwined thicker fibers branching out in arboreal fashion. The cortex also exhibited an axonal network, denser in the lower layers. Injection of 10 mg/kg of amphetamine sulfate intensified the staining of the fibrillar structures. The number of spines on the dendrites was somewhat larger than when the moderate dose was used and there were more axodendritic contracts on the trunk and spines. Thus, the number of spines per unit of

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POPOVA, E. N., et al., Zhurnal Nevropatologii i Psikhiatrii, No 3, 1973, pp 382-387

dendrite length regularly increased as the dose of amphetamine sulfate was boosted, showing that both the caudate nucleus and the sensorimotor cortex were stimulated by the drug.

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POPOVA, G.M.

COMPUTERS

NEW BOOKS

6800189

Homogeneous Microelectronic Associative Processors

I. V. Prangishvili, G. M. Popova, O. G. Smorodinova, A. A. Chudin, *Odnorodnye mikroelektronnye assotsiativnye protsessory*, Sovetskoe radio, Moscow, 280 pp. The principles of constructing a homogeneous associative parallel processor used for solving a wide class of problems involving batch processing of information is described. This processor has three times the productivity and much greater efficiency than modern computers.

Methods of executing arithmetic, logic, and retrieval operations using the processor are described, and appropriate algorithms and programs are presented. Examples of solving various problems via the processor are examined and comparative evaluations of the times required for their solution using the processor and ordinary computers are given. Problems which lend themselves to batch processing, including pattern recognition, classification, and identification, and situations involving economic planning and management, medical and technical diagnostics, radar and sonar, weather forecasting, etc., are discussed.

A survey is made of some of the more interesting foreign work on the construction of associative parallel processors. Current capabilities of microelectronics for the execution of these processors using LIC are examined.

The book will be of interest to a wide range of engineering, technical, and scientific personnel, and to students of higher educational institutions who are interested in computers, engineering cybernetics, and microelectronics.

Printed Circuits in Instrument Design, Computer Technology, and Automation

A. T. Belyaeva (ed.), *Pechatnye skhemy v priborostroenii, vychislitel'noj tekhnike i avtomatike*, Mashinostroenie, Moscow, 1973, 269 pp. A systematic description of the basic problems of design, production technology, and use of printed circuits is presented in this book. The most advanced experience and achievements of domestic and foreign technology are included. Materials used for the production of printed circuits; methods of preparing the prototypes of these circuits; special features of constructing printed circuits, including analysis of the basic design-engineering problems and design versions, are described in detail. Much attention is devoted to the design of printed circuit conductors and basic printed elements for lower and higher frequencies. In examining the problems of manufacturing printed plates, a step by step description is presented of plate production, design of printed

Automatic Control: Instruments

USSR

UDC: 681.325.65

PRANGISHVILI, I. V., POPOVA, G. M., USKACH, M. A., FETISOVA, S. V., MOSKOV, B. A., RUDERMAN, L. Z., KOPEYKIN, G. A., Institute of Automation and Remote Control (Technical Cybernetics)

"An Element of Homogeneous Structure"

USSR Author's Certificate No 287115, filed 11 Mar 69, published 18 Feb 71 (from RZh-Avtomatika, Telemekhanika i Vychislitel'naya Tekhnika, No 10, Oct 71, Abstract No 10B169 P)

Translation: Elements are known which can be used as cells of homogeneous structure in addition to other applications. A multifunctional element used as a cell of homogeneous structure has the disadvantage that only the outputs are commutated in such an element, and the logic inputs are not commutated. This limits its functional possibilities: e. g., the cell cannot be used for high-speed homogeneous structures with feed-through current lines through which signals propagate with practically no delay (bus structures). For coupling to the lines, the cells must have commutatable inputs and outputs: i. e., they must receive signals from the line and transfer signals to the line. In addition, in the case of external interference the information must be periodically transferred to the cell flip-flops to correct

APPROVED FOR RELEASE: 08/09/2001 CIA-RDP86-00513R002202520003-5"

USSR

PRANGISHVILI, I. V. et al., Soviet Patent No 287115

failures which may occur. In a multifunctional logic circuit in the multiple-transfer mode, all flip-flops are preset to the zero state each time, regardless of the presence of failures. This interrupts the function being realized by the structure each time, which is a considerable disadvantage of the logic circuit. The purpose of this invention is to extend the functional possibilities and increase the speed of the homogeneous structure. In the proposed element, this purpose is achieved by redistributing the control circuit between the inputs and outputs of the element without increasing the total number of components: i. e.,some of the inputs and outputs are made commutatable, and some are not. Only the commutatable inputs and outputs are used in connecting the element to the lines. In connecting the elements to one another, the noncommutatable inputs of one element are connected to the commutatable inputs of the other, and vice versa. Thus between any elements of the structure (between adjacent cells or between the cells and the lines) a controllable data transmission channel is formed which may be switched on or off depending on the debugging code. The circuit for setting and resetting the flip-flops is made in such a way that when information is being transferred, the flip-flops are set immediately to a predetermined state without presetting to the zero state in order to correct failures. This procedure makes it possible to use a logic cell in high-

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USSR

PRANGISHVILI, I. V. et al., Soviet Patent No 287115

-speed bus structures, as well as to improve the interference suppression of the structure by means of multiple transfer. One illustration.

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POPOVA, G.M.

Mathematics

GLORIA

10: JPRS 55352
6 MAR 1972

PART III

PRINCIPLES OF CONSTRUCTING COMPUTERS AND METHODS OF ORGANIZING COMPUTATION PROCESSES IN HOMOGENEOUS MICROELECTRONIC STRUCTURES

[Article by I. V. Prangishvili, Ye. V. Babicheva, G. M. Popova, M. A. Uskach; Moscow, V Vsesoyuznoye Soveshchaniye po Problemam Upravleniya, Moscow, 1971, Referaty Dokladov, Russian, Part III, 1971, pp 109-112]

One of the prospective means of constructing fourth generation digital computers is construction of them on the basis of homogeneous structures made of large integrated circuits. The methods of organizing the computation processes based on group data processing are used here: the associative principle of retrieval and calculation, schematic simulation of the algorithms, flow or conveyor data processing methods and the principles of pictorial logic. In the case of schematic simulation of the algorithms in homogeneous structures, each operator corresponds to the circuit executing it. The number of arithmetic operator circuits required for the specific algorithm is organized in the homogeneous structures instead of the arithmetic module, and local memory files are placed in direct proximity to the operator circuits instead of a common memory. Analogously, each control operator corresponds to a local control circuit servicing the arithmetic unit and the memory module.

Organization of two types of operative memories is possible in homogeneous structures: static and dynamic memories. From the point of view of equipment expenditures (number of cells) preference must be given to the dynamic memory. The ready-access memory of the dynamic type (with ordered and address access) is organized from the cells of the homogeneous structures closed in a ring and set to execute the delay function. In a ready-access memory with ordered access, replacement of the register information is carried out after completion of the operation on the contents of the end register P_1 under the effect of the control signal. The information is copied from register P_2 into register P_1, from P_3 into P_2, and so on. As the control signal moves along the synchronous channel (the chain of cells set for the synchronous delay function), the information is copied from the preceding register into the following one. ... the access is nondestructive, the contents of register P_1 are copied over the synchronous channel into the last register P_n. In a ready-access memory with random access, coincidence of two control signals in time is used for writing and reading. The address in this ready-access

USSR

UDC 681.3.056

PRANGISHVILI, I. V., POPOVA, G. M., USKACH, M. A., FETISOVA, S. V., MOSKOV, B. A., RUDERMAN, L. Z., KOPEYKIN, G. A., Institute of Automation and Remote Control (Technical Cybernetics)

"An Element of Homogeneous Structure"

Moscow, Otkrytiya, izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, 1970, No 35, Soviet Patent No 287115, class 21, filed 11 Mar 69, published 19 Nov 70, pp 62-63

Translation: This Author's Certificate introduces an element of homogeneous structure which contains AND, OR, AND-NOT and NOT circuits, flip-flops, commutated inputs, noncommutated inputs, and inputs for horizontal and vertical tuning lines. As a distinguishing feature of the patent, the functional possibilities of the element are extended and the speed of the homogeneous structure is increased by connecting the inputs of the AND circuits for setting the flip-flops to one, to the horizontal and vertical tuning lines, while the inputs of the AND circuits for setting the flip-flops to zero are connected to the horizontal tuning lines, and through the NOT circuits to the vertical tuning lines. The outputs of the first two flip-flops are connected to the inputs of the OR circuits, which are

USSR

PRANGISHVILI, I. V., et al., Otkrytiya, izobreteniya, promyshlennyye obraztsy, tovarnyye znaki, 1970, No 35, Soviet Patent No 287115, class 21, filed 11 Mar 69, published 19 Nov 70, pp 62-63

also connected to the commutated inputs of the element. The outputs of these OR circuits are connected together with the noncommutated inputs of the element through an AND circuit to the input of a "mod 2 addition" circuit. Also connected to this addition circuit are the outputs of a third flip-flop. The outputs of the remaining flip-flops are connected to AND-NOT output circuits, whose inputs are also connected to the output of the "mod 2 addition" circuit and through a NOT element to one of the outputs of the structure element.

2/2

Acc. Nr: AP0049027 Ref. Code: UR0607

PRIMARY SOURCE: Vestnik Otorinolaringologii, 1970, Nr 1, pp 18-24

NASAL POLYPOSIS AS AN AUTOIMMUNE DISEASE

G. N. Popova, A. M. Monayenkov, N. N. Tarasevich (Moscow)

Summary

The authors studied nasal polyposis from the viewpoint of the possibility of referring it to autoimmune diseases. In the patient's serum the content of autoantibodies to specially prepared polyp antigen was investigated. The following techniques were employed: latex-agglutination, passive hemagglutination and the immunofluorescent method. In serological reactions the authors used the principle of consecutive employment of antigens — at the first stage the serum was exhausted by normal tissue antigen and then the reaction with polyp antigen occurred. The reactions of latex-agglutination and passive hemagglutination demonstrated the presence of autoantibodies to polyp antigen in all patients with nasal polyposis in different dilutions (reaction of latex-agglutination in dilution of 1 : 8—1 : 64, reaction of passive hemagglutination — 1 : 50—1 : 1000). In control sera autoantibodies were practically absent.

REEL/FRAME
19800808

Apart from the blood serum the polyp fluid was also subjected to serological analysis. Autoantibodies to polyp antigen were revealed in titers of 1:50—1:800. In 2 out of 10 patients the autoantibody titer in the polyp fluid markedly surpassed the titer of antibodies in the blood serum.

By means of the immunofluorescent method in the polyp tissue an antigen-antibody complex was revealed.

The dynamics of autoantibody accumulation was studied at diverse periods of the disease — during relapse of polyposis and during the period free of polyps. There was noted a definite relation between the antibody titers and stage of the disease — intensification during relapses of polyposis and decline of autoantibody titers during the period free of polyps. The data derived make it possible to state that autoimmune reactions play a definite role in the pathogenesis of nasal polyposis.

2/2

19800809

1/2 015 UNCLASSIFIED PROCESSING DATE--30OCT70

TITLE--SYNTHESIS OF ACRYLONITRILE COPOLYMERS CONTAINING REACTIVE METHYLOLAMIDE GROUPS -U-

AUTHOR-(05)-POPOVA, G.P., KIRPICHENKO, T.R., GLAZOMITSKIY, K.L., GOLTSIN, B.E., ROSKIN, YE.S.

COUNTRY OF INFO--USSR

SOURCE--IZV. VYSSH. UCHEB. ZAVED., KHIM. KHIM. TEKHNOL. 1970, 13(2), 259-62

DATE PUBLISHED----------70

SUBJECT AREAS--CHEMISTRY

TOPIC TAGS--ORGANIC SYNTHESIS, ACRYLONITRILE, COPOLYMER, AMIDE, CHEMICAL REACTION RATE

CONTROL MARKING--NO RESTRICTIONS

DOCUMENT CLASS--UNCLASSIFIED

PROXY REEL/FRAME--2000/0966 STEP NO--UR/0153/70/013/002/0259/0262

CIRC ACCESSION NO--AP0124625

UNCLASSIFIED